

From: Gordon R Wilson <gwilson@mrcnh.com>
Subject: **Fwd: 2003JA010356R Decision Letter**
Date: 15 June, 2004 08:40:59 EDT
To: Thomas E Moore <tmoore@lepvax.gsfc.nasa.gov>

From: jgr-spacephysics@agu.org
X-Mailer: MIME::Lite 2.106 (B2.11; Q2.03)
Date: Wed, 9 Jun 2004 21:15:08 UT
To: gwilson@mrcnh.com
Subject: 2003JA010356R Decision Letter
Reply-To: jgrsp@ucar.edu

Manuscript Number: 2003JA010356R
Manuscript Title: The response of terrestrial neutral outflow to magnetic activity

Dear Dr. Wilson:

Thank you for the revised manuscript and the responses to the reviewers' comments. Unfortunately, I do not find that the concerns of Reviewer #2 about the clarity of the manuscript have been adequately addressed. Please carefully address the following points.

1. Reviewer #2's concern about the lack of a stated hypothesis relates to the way the topic and the motivation for this study should be introduced in the Introduction, and to the way the data should be analyzed. Effectively, the five stated Conclusions (or their converses) could be considered hypotheses that are being tested by the analysis. The motivation for this study is the need or desire to verify or disprove these hypotheses. The Introduction should explain this motivation. The data analysis should be designed to test the hypotheses.

My perusal of the manuscript gives me the impression that the data analysis was not really designed to provide good tests of hypotheses related to the stated Conclusions. Although the composition, energy, and direction of the measured ENA are important for the conclusions, the first step in the analysis was to collapse the LENA data over mass, energy, and polar angle, which would seem to discard critical information needed to support those conclusions. To interpret the collapsed data then requires trying to infer some of the lost information through other considerations. This approach makes the interpretation very difficult to follow, and considerably weakens the support for the stated conclusions. One way to solve this problem would be to design and carry out a new analysis in a manner that is focused on the hypotheses under consideration. Alternatively, it may be possible to revise the presentation of the existing analysis in a way that clearly supports the interpretations and conclusions. Unfortunately, the present revision of the manuscript has not achieved that.

2. The presentation and discussion of the data in terms of spacecraft-related directions makes geophysical interpretation very difficult, as

noted by Reviewer #2. What is the significance of averaging the LENA data over all (spacecraft) polar angles, instead of over some geophysically meaningful coordinate and/or direction? What makes "post-perigee" geophysically significant, as the manuscript seems to imply? Is it not rather the different latitude and/or longitude post-perigee compared with pre-perigee that is geophysically significant? If so, what are the geophysically significant parameters? Is there some geophysically significant difference between the directions of trailing and approaching limb? If so, what significance? It will be necessary either to justify the use of spacecraft-oriented directions, and to make much clearer how they relate to geolocation, or the analysis should be redone in geophysically meaningful coordinates.

3. Although a paragraph was added giving some information about the model used to construct Figure 8, the information is inadequate for a reader like Reviewer #2 or myself to understand the nature of the model and the basic assumptions that go into it. What produces the ENA in the model? What are the model limitations?

In addition to the above problems related to Reviewer #2's comments, I noted the following problems as I perused the manuscript.

4. The abstract concludes from "post-perigee" observations that many of the ENA come from the auroral zone. What is the relation of post-perigee to the auroral zone?

5. In the abstract, what is meant by "direct energy deposition," as contrasted with energetic O⁺ precipitation? Isn't energetic O⁺ precipitation also a form of direct energy deposition?

6. The title is "The response of terrestrial neutral outflow to magnetic activity," but the main conclusion highlighted in the abstract is "We conclude that diurnal variation in ENA emissions is a winter hemisphere feature that is absent in the summer hemisphere," which does not seem to refer to magnetic activity. What is the focus of the manuscript? Does the title reflect this focus?

7. To interpret the observations relative to perigee and limb directions, the reader needs information about the location of perigee (altitude, magnetic latitude, MLT) and direction of motion of the spacecraft, and how these vary during the period of data analyzed. Dipole tilt appears also to be a relevant parameter. For the data displayed in Figures 1 and 3 one can figure out some of that information, but some of the information is not obvious. Furthermore, the needed information is not explained with respect to the other data that have been analyzed, that is, with respect to data other than those presented in Figures 1 and 3.

8. What is the orientation of the spacecraft spin axis with respect to its orbit? This information is needed for interpreting the data that are presented.

9. If the data are averaged over all polar angles of LENA, then what do

the directions "nadir," "limb," and "ram" signify? Presumably, those directions can have only a single polar angle, but the data are apparently averaged over a range of polar angles.

10. In Figure 5, what does "integral flux" mean, and how is it calculated? Are the data evenly distributed in local time?

11. I have the impression that "orbit" sometimes refers to particle trajectories rather than the spacecraft trajectory, but this is not always clear. For example, on p. 6: "Flux is received at the spacecraft if the orbit tracked back from the spacecraft intersects the source region." When orbits are discussed, please make sure it is clear what is orbiting.

If you wish to submit a revised manuscript, please do so by August 18, 2004. Please include a revised Response to Reviewer letter with detailed responses to the reviewers' comments, and include a Cover Letter that responds to my comments, above. If you need an extension of this deadline, contact our office before that date; a longer turnaround period can be granted. If you do not plan to submit a revision, I would be grateful if you could let me know as soon as possible.

Please review the Important Links to JGR Information attached below before uploading your revised manuscript.

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Thank you for your attention to this matter.

Sincerely,

Arthur Richmond
Editor, Journal of Geophysical Research - Space Physics

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